REMARKS

Status of the Claims

Claims 1-4 and 11-17 and 24 are pending, withdrawn claims 18-23 having been cancelled above.

Rejection of Claims 1, 3, 4, 11-15 and 24 – 35 U.S.C. § 102(b)

Claims 1, 3, 4, 11-15 and 24 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,795, 529 to Kawasaki et al. (hereinafter "Kawasaki"). The Applicants respectfully traverse this rejection and its supporting remarks.

"To anticipate, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim." *Brown v. 3M,* 265 F.3d 1349, 60 USPQ2d 1375 (Fed. Cir. 2001). Claim 1, the only independent claim presently pending, reads as follows:

> 1. A method for etching a capacitor structure within a silicon substrate, said method comprising:
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> providing a masked substrate comprising a patterned masking layer over said silicon substrate, said patterned masking layer having at least one aperture formed therein;
>
> performing a series of process steps upon said silicon substrate through said at least one aperture in said patterned masking layer, said series of process steps comprising (a) an isotropic plasma etching step in which said silicon substrate is etched; and (b) a plasma deposition step in which a passivating layer is deposited on said silicon substrate; and
>
> repeating said series of process steps until a desired etch depth for said capacitor structure is achieved, wherein said capacitor structure comprises an etched sidewall with an undulating profile that has an increased surface area relative to a smooth sidewall.

Hence, claim 1 requires the repetition of a series of process steps that comprise (1) an *isotropic* plasma etching step and (2) a plasma deposition step, thereby producing a capacitor structure which comprises an etched sidewall having an undulating profile. One example of such a structure is schematically illustrated in Fig. 13 of the present application.

Kawasaki, in contrast, is fundamentally different from claim 1 in that this reference teaches varying potential to alternate between (1) a time period of relatively *anisotropic* etching and (2) a time period of plasma deposition. See, e.g., col. 5, line 45 to col. 6, line 36

of Kawasaki. Note that the etching is almost completely anisotropic, with downward etching far outpacing lateral etching. In this regard, see, e.g., col. 5, line 63 to col. 7, line 2, in which it is stated that the undercut depth in the lateral direction is only about 1/5 to 1/10 the etching depth in the vertical direction.

Hence, Kawasaki teaches a relatively *anisotropic* etching step, while the etching step of claim 1 of the present invention is, on the other hand, relatively *isotropic*. The consequences of this difference can be seen, for example, by comparing the sidewall profile illustrated in Fig. 6 of Kawasaki (as noted above, the undercut depth in the lateral direction is only about 1/5 to 1/10 the etching depth in the vertical direction) with the undulating sidewall profile of the embodiment of Fig. 13 of the present specification, which illustrates a series of concave sidewall segments, and more particularly, a series of balloon-like segments, which collectively take on a cloud-like shape.

Note also that the present invention is directed to a process for creating capacitor structures that comprise an etched sidewall with an undulating profile, which sidewall has an increased surface area relative to a smooth sidewall. In this regard, capacitor structures having a textured surface on at least one of the plates exhibit increased capacitance. See, for example, U.S. Patent No. 5,166,904 to Hazani. Kawasaki, in contrast, is attempting to create structures which have a high aspect ratio while at the same time minimizing undercut to secure dimensional accuracy. See, e.g., col. 5, lines 45-54, and col. 6, lines 2-4 of Kawasaki.

For at least the above reasons, it is respectfully submitted that claim 1 is patentable over Kawasaki. Claims 3, 4, 11-15 and 24, which depend from claim 1, are therefore patentable over Kawasaki for at least the same reasons.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 3, 4, 11-15 and 24 under 35 U.S.C. 102(b) as being unpatentable over Kawasaki are respectfully requested.

Rejection of Claims 2, 16 and 17– 35 U.S.C. § 103(a)

Claims 2 and 16-17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kawasaki in view of U.S. Patent No. 6,191,043 to McReynolds (hereinafter "McReynolds"). The Applicants respectfully traverse this rejection and its supporting remarks.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103, (a) there must be some suggestion or motivation to modify/combine the references of record, and (b) there must be a reasonable expectation of success. See MPEP §2143. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *Id.*

As noted above, claim 1 is unobvious in view of Kawasaki because, *inter alia*, Kawasaki neither teaches nor suggests the repetition of a series of process steps which comprise: (1) an *isotropic* plasma etching step and (2) a plasma deposition step, thereby producing a capacitor structure comprising an etched sidewall that has an undulating profile.

McReynolds does not teach nor suggest such a process and therefore does not make up for the above-noted deficiencies in Kawasaki. In fact, McReynolds is directed to a method for etching deep openings with *straight vertical* sidewalls (see, e.g., Figs. 5A and 5B, and the associated discussion at col. 5 of McReynolds) and thus teaches away from the invention claimed in claim 1, in which a sidewall with an undulating profile is produced. Accordingly, it is respectfully submitted that claim 1 is patentable over Kawasaki in view of McReynolds for at least these reasons.

Dependent claims 2 and 16-17 depend from claim 1 and are therefore patentable over Kawasaki in view of McReynolds for at least the same reasons.

Reconsideration and withdrawal of the rejection of claims 2 and 16-17 under 35 USC §103(a) as being unpatentable over Kawasaki in view of McReynolds are therefore requested.

CONCLUSION

Applicants submit that the claims of the present invention are in condition for allowance, early notification of which is earnestly solicited. Should the Examiner be of the view that an interview would expedite consideration of this Amendment or of the application at large, request is made that the Examiner telephone the Applicant's attorney at (703) 433-0510 to resolve any outstanding issues.

FEES

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